

VARĀHAMIHIRA'S CONTRIBUTION TO THE VEDIC THEORY OF THE EARTH

ABSTRACT

The author presents various observations made and compiled by Varāhamihira on the changes of the animate and inanimate fields of the earth in his text *Brihatsamhitā*, specially correlated with the movements of various members of the Solar system through the ecliptic. Some important points of compilation of earlier observations have been explained by modern geological understanding. The changes in the atmosphere, formation and precipitation of clouds, the crop position, the rain fall, changes in sociological, political and other fields etc. correlated with the movements of the heavenly bodies are presented. The data presented include observations of several generations of humanity, specially from Vedic times to the times of Varāhamihira.

It is presented as the preliminary concepts of a theory of the earth, which needs verification at the present juncture of the history. The predictive element in the theory is appreciated, specially to trace the annual outcome of the terrestrial changes by considering certain specific correlations.

INTRODUCTION

The cosmic theory of the earth recognised in the Vedas received considerable attention during the post-Vedic times. Many sages contributed to the growth of stellar science but of many students of the subject some 18 were considered by Kāshyapa. They were:

Sūrya, Pitāmaha, Vyāsa, Vasishta, Atri, Parāshara, Kāshyapa, Nārada, Garga, Marici, Āngiras, Lomasha, Poulisha, Yavana, Cyavana, Bhrigu and Shounaka.

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Pulasthya, Vishwasrid, Vishwāmitra, Kanwa and many others also made significant contributions. However, not all the texts of astronomical treatises were available for the later authorities and by the time of Varāhamihira, although much development was witnessed in astronomy, many of the texts were lost. Of the available literature now, that of Varāhamihira is the most authentic and he has presented in his text «Brihatsamhitā» a summary of all important observation which were available to him.

The subject of stellar science was studied under three major divisions viz., principles of astronomy, construction of ephemerides and presentation or interpretation or results based on earlier observation i.e. the predictive section. All the three divisions of stellar science received considerable attention by many students and the observations made by them appears to have been stupendous by the time of Varāhamihira. He has been able to present a compilation as he states, specially with his own critical evaluation. Not only the correct movements of the celestial bodies were ascertained, but also their effects on terrestrial phenomena correlated to their specific dispositions. Similarly, events were predicted based on advanced calculations of comparable planetary dispositions.

What is the basis of such a theory which calls or establishes the relationship between the earth and the heavenly bodies? How the terrestrial phenomena get influenced by the heavenly bodies which are at such distance? The heavenly bodies were called by the students of Jyotisha as «Grahas» meaning those which «attract» or «drag», since they were in movements in circles and dragged by others. This was recognised by the Vedic seers who described the law of movement of all these bodies as «Rta» which also caused the seasons, hence they were addressed as «Ritus». Based upon the advanced calculations of the movements of «Grahas» they could predict the events on similar earlier observations, they came to the conclusion that the Universal theory adopted was correct and expressed truth of existence, specially on their concept of «Ātma» and «Brahma» relation, i.e. Pin-danda and Brahmanda correlation. More than this they could not establish any visible evidence of such a fundamental relationship. Since the Vedas contained most of the results of the Stellar Science, the foundations of which were questionable but the result of which were practically verified and proved to be true, they agreed to keep the Vedas above anybody's questionable premises. That is why Sayanacarya defined the Vedas as: «Pratyakshenaanumityaa va yastoopaaayo na budhyate enam vidanti vedena tasmad vedasya vedata», meaning that the sanctity of Veda is in its effect making clear the result which is not ordinarily known by evidences seen or inferred. Hence, the grand truths of the Vedas came to be recognised as above «Time & Space» and they are eternal truths. In this sense, no body can establish a direct contact between the earth and other heavenly bodies to explain these

facts which have been correlated. The forces which are actually responsible for the movement of the earth and other celestial bodies is invisible and the « drag » or attraction is now explained by scientists by the law of Gravitation or more refined laws of Relativity. Even then they just do not accept the presence of any influence of these extra-terrestrial bodies on the earth, since there is no direct visible contact between and amongst themselves. It is just like the relationship that prevails between passengers of a moving bus, who little realise that all of them are moving with the speed of the bus. There cannot be any direct relationship than the spin of the earth itself without which there can hardly be any day and night. Since the Vedic seers could realise this early, they could establish the Theory of the Earth and record the influences of various celestial bodies in motion on the animate and inanimate objects of the earth. In the work *Brihatsamhitā*, Varāhamihira has presented the geological influences of the various members of the Solar family during their movement through the heavenly path.

CORRELATION OF THE TERRESTRIAL EVENTS WITH SOLAR PHENOMENA

At the outset Varāhamihira observed that during some past age the sun's apparent southerly movement used to commence from the latter half of *Āśleṣha* star and the apparent northerly movement from the beginning of *Dhanishta* star, since such a discussion has been presented in literature earlier to him. This is a very important point. Further, observations by him suggested that if the sun did not continue his southerly movement after reaching *Makara rasi*, the result would be destruction.

In the case when the sun does not enter *Makara* and returns to south, then destruction to places situated in the south and west; and in the case when he does not enter *Kataka* and returns to north then destruction to places situated in the north and east was mentioned. This observation has been made by Varāhamihira based on the earlier observation by *Garga*. *Garga* observed that when the sun returns not reaching *Dhanishta* star in *Uttarāyana* and does so not reaching *Āśleṣha* in *Dakṣiṇāyana*, then it suggests great fear due to geological changes. This observation was due yet earlier to *Parāshara*, hence more than one authority has subscribed to this fact.

This observation may look absurd to a non-geoscientist. The modern students of the earth will consider this observation with great admiration and care, for fear due to geological changes during such rare phenomena is obvious, since such a change involves either a slow or sudden but of short durational changes in the earth's pole. Change in the disposition of the earth's pole has been recognised in the geological

past, specially during the last 60 million year history of the earth based on palaeomagnetic studies. The change in pole disposition of the earth causes change in the distribution of ice caps, climate and land and sea distribution caused by changes in the geophysical phenomena. Unless such activities had been witnessed a discussion like this would not have been possible in the early texts. Thus the antiquity of record is itself a proof to confirm the modern concept of polar-wandering as it is called. The concept will receive more attention in the treatment later.

Another observation is that the sun, excepting parva days, if seen covered with darkness (Sun-spot), the situation portends many terrestrial changes. This observation is also confirmable from modern studies when geological changes have been correlated with the occurrence of sun-spots or dark spots in the sun. This dark cover of the sun is referred to as « Twashta » and is said to cause danger from fire and famine.

Depending upon the nature of darkness within the disc of the sun or moon during eclipse, some very relevant observations have been made. Before such dark covers form on the disc of the sun or moon during eclipses, there will be disturbance of groundwater and surface water, occurrence of ternedos, high speed winds charged with dust particles destroying the mountain peaks and forests, appearance of fruits and flowers exceptional to the seasons, excessive heat of the sun, burning in certain directions, charging of powerful winds on the earth etc. These phenomena indicate the appearance of dark cover on the disc of the sun and moon within a week. If such dark covering is not seen during this period, there will be untoward biological effects in the directions of the occurrence of these phenomena.

In the dark cover on the disc of the sun appears which resembles a stick, political disturbance, if resembles a headless body, fear of epidemic, resembling the crow, increase in thefts, and resembling « Keel », then famine are indicated. If these phenomena are followed by immediate rains, there will be peace.

If the sun looks to be of the colour given below during the seasons mentioned against, then it will portend prosperity:

<i>Seasons</i>	<i>Colour/s</i>
Shishirt	red or white
Vasant	green or reddish
Greeshmrt	golden or whitish
Varshrt	white or pale white
Sharadrt	center of lotus
Hemantrt	blood red

Blood red coloured sun in Greeshmrt indicates some kind of fear in biological field, dark sun in Varshrt indicates rainlessness, pale white or yellowish sun during Hemantrt indicates fear of epidemics.

During Varshrt if the sun has the hue of shereesh flower there will be rains immediately; but if the sun is of the hue of peacock feather, then there will be no rains for 12 years.

If the sun looks with cloudy shade, then there will be destruction due to insects, if he is seen with the shade of smoke then there will be political disturbances.

If the sun disc is looked with the colour of the blood of hare, then there will be war. Of the colour of the moon the sun disc indicates political changes.

If the sun disc appears resembling a pot, then those countries witnessing the phenomena will suffer from famine. Also if the sun disc appears to purturb like the flag or the wire of bow, then there will be war. Dark lines in the sun disc portend death of the political head by ministers.

Fall of meteor, strike of thunder etc., at the sun rise portends change of political head. Similar results are noted when the sun is surrounded by a rim of dust (Parivesha) during sun rise and sunset, political change is certain.

After sunrise for about an hour a small cloud illuminated by the sunrise looks like another sun and is called « Pratisūrya ». If Pratisūrya is to the north of the sun, rain, to the south, storm, on both sides, political change and to the lower side, biological destruction are indicated.

The sun of pure rays, of complete disc, of bold outline, of unpurturbed nature, without any kind of dark spot etc., portends prosperity and peace. It is also noted that the star on the background of the sun during the alignment of the earth is believed to get purified by the rays of the sun.

CORRELATION OF THE TERRESTRIAL EVENTS WITH THE MOVEMENTS OF THE MOON

After describing the mechanism of increase and decrease of lighting of the moon from the sun light, Varāhamihira proceeds to observe that when the moon transits south of Jyeshtha. Moola, Poorvashadha and Uttarashadha, there will be destruction of seeds, life in oceans and forests. Some ten kinds of lunar disposition have been recognised and are correlated with terrestrial events. The earlier authorities appear to have paid more attention to these lunar dispositions, specially of the new moon. Nou, Lāngal, Dushta-lāngal, Samashring, Kārmuk, Pārshwashāyee. Āvarjit, Kundākār, Uttar-shring and Dakshina-shring are the ten new moon dispositions.

The disposition called Nou, when the new moon resembles the outline of ship, causes difficulties to naval people. When the new moon has its one horn halfraised it is called Lāngal, indicates difficulties

to people engaged in ploughing, and unusual friendship amongst the rulers. That disposition of the moon is called *Dushta-lāngal* when the southern horn of the moon is half raised and indicates army movement and destruction to the Pāndyan king. When both the horns of a new moon raise equal, then such a disposition of the new moon is called *Sama-shring* and portends peace and prosperity. If the new moon resembles a stick, then there will be death to cattle and severe punishment order by law. When the new moon rises with a disposition resembling that of bow, then there will be war and the party lying to the side of the string will win. When the horns of the new moon get widened in the north and south then it is called *Yugasthān* and indicates earthquakes. When in the Yuga disposition there will be a little increase in the height of the southern horn, the structure goes under the name *Pārshwashāyee* and portends destruction to business magnets and rains. When one of the horns of the moon is directed downwards then the disposition is called *Āverjit* and portends famine. When the new moon looks round the disposition goes under the name *Kundākār* and indicates defection of subordinates. While the disposition called *Uttara-shring*, with the horn of the new moon raised to the north, suggests peace and plenty, the disposition with the horn raised to the south called *Dakshinashring* portends fear and famine. When one of the horns of the new moon is totally unseen or downward or of a new form, then instant death of the person witnessing the scene is mentioned. If the disc of the moon is small, then famine; if it is large, peace and plenty are indicated.

The lunar horn struck by mars indicates death to administrative heads put to at great distance, struck by saturn indicates fear of hunger and of weapons (war), struck by mercury no rains and famine, struck by jupiter death to famous rulers, struck by venus death of some local rulers are indicated. During the bright fortnight the results mentioned will be little and complete during dark fortnight. If the lunar disc is affected by venus, then fearful death will take place for seven months in Magadh, Yavana, Pulinda, Nepal, Bhiringi, Kutch, Marudesh, Surat, Madra, Punjab, Kashmir, Kulootak, Purushād and Usheenear regions. If the lunar disc is affected by jupiter, then there will be destruction of grain for ten months in Gāndhāra, Souvira, Sindhu, Keera, Pārvasiya and Dravid regions. The lunar disc affected by mars indicates destruction to peoples in Trigart, Mālava. Koulind, Shibi and Ayodhya regions. Also, death of administrative heads in Kuru, Mathsya, Shukti regions is mentioned to be caused within six months by this affliction. Saturn afflicting the lunar disc causes death and destruction to the people and administrators of Kuru land and dynasty and the rulers of the east lands, for ten months. Mercury affecting the lunar disc suggests destruction of the people of Magadh, Mathura and those residing on the bank of Vena river but causes prosperity and plenty to those people of the western lands.

Fall of meteor at the time of eclipse indicates death of the rulers governed by the star in which eclipse takes place. If moon is ash coloured, red or dark, or perturbed, it portends famine, epidemics, etc.

CORRELATION OF TERRESTRIAL EVENTS WITH THE ECLIPSES ETC.

Observation of eclipses and their knowledge of occurrence in advance has been as old as the Vedic compositions. In the Vedas, as has already been mentioned, Swarbhanu was thought to cause eclipses. This is clear from the Vedic observation that: «Swarbhaanurha va aasuri tamasaā vivyaadheti» etc. But Varāhamihira describes the occurrences of eclipses on lines as scientific as modern, as due to the shadow of the sun on the moon due to earth as eclipse of the moon and the shadow of the sun on the earth due to moon as eclipse of the sun. Eclipse is called «Grahana» as also «Upaaraaga» according to Naama-lingaanushaasanam which mentions that: «Upaaraago grahe raahu graste tu indou ca poushni ca», and suggests that the term «Upaaraaga» is used to denote some kind of additional colour or change in the original hue of the sun or the moon due to eclipse. «Grahana» means literally «absence of graha or the heavenly body» since on account of complete eclipse the heavenly body, either the sun or the moon, will not be seen for the duration of eclipse.

The early authorities in astronomical disciplines have been able to correlate many important events to eclipses. In relating such events to the eclipses, it has perhaps become customary to say that they have been «due to» the eclipses since such events have been more than one time confirmed. Eventhough, it may be erroneous to say that the eclipses have caused such and such an event, it is certainly correct to say that those events are correlated to the heavenly phenomena.

Varāhamihira observed that some earlier authorities said that if there be a grouping of five heavenly bodies on any new moon or full moon day, then no eclipse will take place. If an eclipse occurs, then on the preceding 8th day of the bright or the dark half, the direction of commencement, and end of the ensuing eclipse may be ascertained by pouring oil on water and observing the direction of spread of oil on water. But, Varāhamihira says that the observation that there will be no eclipse if there be a combination of five heavenly bodies on a full or new moon day is not correct. Further, he observed, that eclipses should be ascertained by the astronomical procedures laid down for eclipses.

From the commencement of Kalpa, successive periods of each six months are named as Brahma, Shashi, Indra, Kubera, Varuna, Agni and Yama. Eclipse during Brahma period is correlated with all round

prosperity; Shashi period also with all round prosperity but shortage of rains; Indra period with differences amongst administrative heads, destruction of crops of Sharadrt and sickness to people; Kubera period with destruction of money of wealthy but prosperity to people; Varuna period with untoward for administrators, good for public and increase in corns; Agni or Mitra period with increase in corns, good health of public and sufficient rains; Yama period with shortage of rains, destruction of grains and famine.

If eclipse occurs earlier than the period indicated by calculation such eclipse is called « Velaahen »; if beyond then « Ativela ». Velaahen eclipse is correlated with destruction of rainy clouds, and indication of wars. Ativela eclipse is correlated with destruction of orchards of fruit trees and grains.

The foregoing observations are according to earlier authorities says Varāhamihira and observed that there cannot be any eclipse which is not ascertained by astronomical calculations. It appears that the above observations were some kind of a thumb rule of six months duration enunciated by early workers and Varāhamihira just dismisses as untenable their outlook of Velaahen and Ativela etc., types of eclipses, specially based on his mathematical conviction.

Varāhamihira next observed (in contrast to the belief of the six month period) that if two eclipses, one of moon and the other of the sun, occur within one lunar month then there will be disturbance in the army and danger to the administrative head. Also, rising and setting of partially eclipsed moon is correlated with destruction of grains of Sharadrt and rising and setting of partially eclipsed sun with destruction of the administrative head. The completely eclipsed sun or moon are associated with other heavenly bodies like the saturn or mars and are correlated with famine and mass destruction of people.

Half risen sun or moon under eclipse are correlated with reference to the commencement and end of eclipse. The duration of day and night into seven sections is suggested and the following biological changes are noted based on the commencement of eclipse. Commencement of eclipse of the half risen sun or moon in the first division is correlated with the affliction to the section of people who live by thermal means; second division with farmers, business people, fighters and chiefs of forces; third division with artists and ministers; the fourth division with affliction to administrative head of the central regions and effecting fair-price of grains; the fifth division with the affliction to ministers, business community, cattle; the sixth division with affliction to relievers and saints. The division in which eclipse ends, the facts observed of that division will be favourable.

Eclipse during the sun's apparent movement in the north is correlated with affliction to scientists and soldiers; the eclipse during sun's apparent southerly movement is correlated with affliction to business and labour communities. Eclipse in the north is correlated with danger

to scientists; in the east to politicians; in the south to business people; and in the west to labourers. Other mundane effects and biological changes noted when the eclipse occurs in the north are affliction to cattle; in the south, affliction to elephants and life in water; in the east, the earth will be flooded; in the west, affliction to farmers and labourers and destruction to seeds.

LOCAL CHANGES CORRELATED WITH ECLIPSES

Many local changes, specially pertaining to the sub-continent of India are enumerated by Varāhamihira based on correlation of eclipse occurring in specific divisions of the ecliptic or the zodiac. Accordingly when a solar or lunar eclipse occurs in the first division (of the 12 ecliptic divisions of 30° each are from the 0° celestial longitude) there will be affliction to the people of Panjab, Kaling, Oudrha, Kirāt areas and people living on thermal means; in the second division, affliction to cattle, dairy-farm managers and honourable citizens; in the third division affliction to respectable women, administrators, artists, people living on the banks of Yamuna river, of Bāhlika desh, Madhya desh (Saketa, Mithila, Campa, Kusha, Koushaambi, Ahikshetra, Gaya, Vin-dhya) and Sahya desh; in the fourth division, affliction to people of Abheera, Shabara, Pallava, Mathsyā, Kuru, Shaka and Panjab areas as also wrestlers and invalids; in the fifth division, affliction to people of Pulinda, Kings and those living in forests and people with power; in the sixth division, affliction to grains, and lands of plenty of crops, people of Tripura and those who live by arts including painting, poetics, drama, music, and rocks; in the seventh division, affliction to people of Avanti, Dashaarn, Maru and Kutch areas and business community; in the eighth division, affliction to people of Udumbar, Madra and Chola desh, fighters and dealers in weapons; in the ninth division, affliction to ministers, important persons, people living in Mithila, Panjab, wrestlers, medicos, fire-armourers; in the tenth division, affliction to life in the seas, ministers, people with base jobs, magicians, medicos and armourers; in the eleventh division, affliction to people living in mountains, people who carry loads, relievers, those who live in western countries and people of Darad, Simhanagar and Burbara desh; in the twelfth division, affliction to life in the oceans and oceanic produces and wise people.

THE TEN TYPES OF ECLIPTIC SHADOWS AND THEIR CORRELATION

Savya, apasavya, leha, grasana, nirodha, avamardana, āroha, agrata, madhyatama and tamontya are the ten patterns of ecliptic shadows and are correlated with various terrestrial phenomena.

When the ecliptic shadow moves on the south of the body it is called « Savya » and is correlated with sufficient rains, peace and prosperity on the earth. Movement of the ecliptic shadow on the left side of the body is called « Apasavya » and is correlated with great affliction to political heads and the people. Ecliptic shadow resembling a tongue goes under the name « Leha » and suggests a world happy with plenty and prosperity. When the ecliptic shadow is half, a third or a fourth size, then it is called « Grasana » and is correlated with the destruction of wealth of a very rich kng. If the ecliptic shadow gets round in the center from four sides of the disc then it is called « Nirodh » and is indicative of biological harmony on the earth. If the eclipse is of long duration and the shadow completely covers the disc then it is called « Avamard » and is correlated with the destruction of the principle ruler and the chief of state. The instant relapsing of eclipse, though not recognised, is called « Āroha » based on earlier observations and is correlated with sever fighting amongst rulers. If the disc is seen covered by smoke and water vapour and resembles like an unclean mirror, then it is called « Agrata » and is correlated with good rains and increase in life. The pattern is called « Madhyatama » when the shadow of the eclipse occupies the center leaving the four sides clear and is correlated with affliction to Madhya desha and sickness in stomach. Ecliptic shadow bordering the disc and leaving the center bright is called « Tamontya » and is correlated with destruction of grains and life. The affliction in Tamontya is called « Ītibādhā » and is said to be six types due to excessive rains, shortage of rains, destruction by rodents, Shalabhas and parrots as also excessive taxation by the rulers.

Mercury's aspect on the eclipsed sun or moon is correlated to the destruction of ghee, honey and oil; that of mars with war, fire accident etc.; that of venus with grains etc., and that of saturn with famine and shortage of rains. Aspect of jupiter on the eclipsed sun or moon will relieve all the evils portended by the aspect of other planets.

If mars is associated with the eclipsed sun or moon, then people of Avanti, haughty kings and those living on the banks of Narmada and Kauveri rivers will be affected; if mercury is associated then people of Antarvedi (land between Ganga and Yamuna), Nepal, and those living on the banks of Sarayu, Shona and east sea as well as administrators, women, children and aged will be afflicted; if jupiter is associated, then people of Sindhu desh and those living on the banks of Sindhu river and also those living in the northern parts as well as learned, ministers, rulers, horses and elephants will be afflicted; if venus is associated then people of Dasherak, Kaikeya, Youdheya and Shibi regions as well as women, ministers etc., will be afflicted; if saturn is associated then people of Pāriyatr and Arbud mountain regions, people of Sourashtr, Pushkar and Marushtal and labour force will be afflicted.

CORRELATION OF ECLIPSES ACCORDING TO LUNAR MONTHS

Varāhamihira then gives a list of correlation of the biological and sociological changes attended by eclipses during the full or new moon of various lunar months.

<i>Lunar months</i>	<i>Terrestrial changes</i> (biological sociological and other affliction to)
Kārtika	People of Magadh, Koshal, Kalmāsh, Shoorasen, Kāshi and also who live on job associated with fire; also minister and king of Kaling will be endangered.
Mārgashira	There will be sufficient rains and grains on the earth but people of Kāshmir, Koshal and Poundr regions and wild life will be afflicted.
Pushya	Differences between scientists and politicians; people of Saindhav, Kukur and Videh will be afflicted and there will be shortage of rains causing famine conditions.
Māgha	People of Anga, Vanga, Kāshi and good citizens, horses and elephants will be afflicted. Considerable rains will prevail.
Phālguna	People of Bangal, Ashmaka, Avanti and Mekhal desh as also artists, sculptures, grains etc., will be afflicted.
Chaitra	Artists, musicians, jewellers, learned in the sacred texts, and those inhabiting Poundr, Oudr, Kekaya and Ashmak desh will be afflicted.
Vaishākha	Destruction to cotton, seashamum, green gram crops and people of Ikshwāku, Shak and Kaling regions will suffer from epidemics.
Jyeshtha	People of Sālva desh and those in the northern parts as well as political heads, grains and rains will be afflicted.
Āshadha	People of Gāndhara, Kāshmir, Pulinda and China desh and those who live on fruits and water and those whose jobs are with water resources will be afflicted.
Shrāvana	People of Kāshmir, Pulind, China, Yavana, Kurukshetra, Gāndhara, Madhya desh and Kāmbhoja and grains which grow during Shardt will be destroyed.
Bhādrapada	People of Kalinga, Vanga, Magadh, Sourashtra, Mleccha, Souvīra, Darad, Ashmak regions and foetus of pregnant ladies will be destroyed.
Āshvayuja	People of Kāmbhoja, China, Yavana, Bāhlika, Sindhu, Ānart, Poundr regions and the surgeons will be afflicted.

These observations can be verified even to this day and the list may need some modifications specially in the context of the modern civilisation. Many of these observations are incorporated in the Hindu Almanacs at present (Panchāṅg) and many stand the test of time.

Based on the direction of the shadow leaving the disc of the moon at the end of eclipses, some more observations have been made. They are listed as given in the text.

Direction of ecliptic

<i>Moksha</i>	<i>Name</i>	<i>Terrestrial chances</i> <i>Mundane</i>
Southeast	Dakshinahanu	Destruction of grains, facial sickness, good rains affliction to the political head.
Northeast	Vāmahanu	Fear of war, facial sickness and peace and plenty.
Southside	Dakshinakukshi	Fight amongst the political heads in the south.
Northside	Vāmakukshi	Destruction of pregnancy in women and even grain crops.
Southwest	Dakshinapāyu	Diseases of genitals and little rains.
Northwest	Vamapāyu	Death to political heads.
East to east	Sacchardan	Plenty and prosperity on the earth.
West to west	Jaran	War tendencies and disturbed peace on the earth.

In the case of eclipse of the sun, the directions mentioned above should be read opposite and the results correlated.

Within a week after the eclipse if there be fall of meteors then there will be destruction of crops; fall of snow and ice, fear of epidemics; earthquake, death of the political head; large fall of meteorite, death of ministers, of variagated clouds; lightening, affliction to political heads, reptiles, wild animals; parivesh, epidemics; digdāh, fear from political heads; storm, fear of someloss; nirghāt, indradhanus etc., famine and fear of other countries; grahayuddh or kethu darshan, fight amongst political heads.

Varieties of burning structures in the sky have been named as Kethu and are recognised in numerous forms. Their appearance, structure, duration etc., have been correlated with terrestrial changes and those observations are beyond the scope of the present treatment.

CORRELATION OF MARTIAN MOVEMENTS WITH THE TERRESTRIAL EVENTS

Based on the appearance of mars from the condition of combustion, i.e. the condition when mars cannot be seen disposed close to the Sun, and gets retrograde in certain starry arc after travelling some distance in the starry path, five kinds of mars have been recognised and terrestrial events have been correlated with each kind of mars.

The five kinds of mars correlated to terrestrial events

When the mars appears from combustion in the arc of some star and gets retrograde in the arc of the 7th, 8th or the 9th star therefrom, such a mars is called « Ushnamukh » and is correlated with affliction to people who live on thermal based activities. If mars retrogrades in the 10th 12th or the 13th star then mars is called « Ashrumukh » and is correlated with shortage of rains, onset of epidemics and poisoning of crops due to poisoned rain waters. If mars retrogrades in the arc of the 13th or the 14th star from the one in which disappears (gets combust), mars is then called « Vyālamukh » and an increase in the population of serpents, wild bores etc. is noted, but the earth will have plenty of food grains etc. If mars retrogrades in the arc of the 15th or the 16th star from the one in which it gets combust, then mars is referred to as « Rudhiraanan » and is correlated with the onset of some kind of facial disease and plenty of foodgrains. Mars is called « Asimusal », when risen in the 17th or the 18th star from the star in which it gets combust and is correlated with shortage of rains and danger from weapons. If mars rises in Purvāphalguni or Uttarāphalguni arc and retrogrades in Uttarāshādhā star, further gets combust in Rohini arc, many afflictions are reported by which all people suffer. When mars rises in Shravana arc and retrogrades in Pushya star affliction to administrators is noted. If mars is combust in Makha star then destruction to Pandyan king is noted, as also shortage of rains and danger from weapons. Further, when mars transits in the middle of Vishākha, then famine is noted and in Rohini epidemic. If mars transits south of Rohini then shortage of rains and inflation are noted.

If mars is seen with smoke or fire, destruction to people living in Pāriyatr desh is reported. Transiting the middle portion of Rohini, Sravana, Moola, Uttarāphalguni, Uttarāshādhā, Uttarābhādra and Jyeshtha stars, destruction to rain giving clouds is noted. Rise of mars in Shravana, Makha, Punarvasu, Moola, Hasta, Poorvābhādrapada, Ashwini, Vishākha and Rohini is correlated with plenty and prosperity on the earth.

CORRELATION OF TERRESTRIAL EVENTS WITH THE MOVEMENTS OF MERCURY

It is generally observed that rise of mercury from combustion is usually associated with some kind of destructive phenomena on the earth involving fire, wind and water. Dissecting the starry path through the arcs of Shravana, Dhanishta, Rohini, Mrigashira and Uttarāshādhā mercury's movement is given to correlate with shortage of rains and fear of some kind of epidemics. When mercury transits in the middle of any of the arcs of the five stars from Āridra to Makha, war, famine, epidemics and shortage of rains is reported. If mercury dissects any of the Yogataras of the arcs of six stars from Hasta to Jyeshtha it is noted to portend calamities to cattle but increase in foodstuff as also inflation. Mercury's dissection of Uttarāphalguni, Krittika, Uttarābhādra or Bhārani portends destruction to life. Dissection of Ashwini, Shatabhisha, Moola or Revati arcs by mercury is correlated with affliction to business community, medicos, naval people, and destruction of oceanic produce and horses. Dissecting Purvāphalguni, Poorvāshādhā or Poorvābhādra arcs mercury is noted to correlate with famine, war and epidemics.

The seven Types of Movements of Mercury

<i>Stars</i>	<i>Types of movements</i>	<i>Duration of rising or setting</i>
Swati Bharani Rohini Krittika	Prākrit	40 days
Mrigashira Āridra Āslesha Āslesha	Vibhinna or Mishra	30 days
Pushya Purvāphalguni, Uttarāphalguni Purvābhādra	Samkshipta	22 days
Uttarābhādra Uttarābhādra Jyeshtha Ashwini Revati	Teekshna	18 days
Moola Purvāshādhā Uttarāshādhā	Yogāntika	9 days

Shravana Chitta Dhanishta Shatabhisha	Ghora	15 days
Hasta Anūrādha Vishākha	Pāpa	9 days

Prākrit movement is noted to portend good rains, crops and plenty of food-stuffs etc.; Samkshipta movement mixed results and other movements are noted to correlate with shortage of rains, destruction of crops etc.

However, according to Devala 4 types of movements of mercury have been recognised with the below mentioned correlation:

<i>Movement</i>	<i>Duration of rise or set</i>	<i>Correlation</i>
Rijwi	30 days	Welfare of people
Ativakraa	24 days	Famine
Vakraa	12 days	War
Vikalaa	6 days	Epidemics

If mercury rises in the lunar months of Pushya, Āshadha, Shrāvana or Māgha, then people will suffer from some kind of fear, if he sets, it portends good of people. If mercury rises in Kārtika or Āshwiyuja lunar months, then danger of weapons, or water, of fire and famine is portendend.

TERRESTRIAL EVENTS CORRELATED WITH THE JUPITERIAN MOVEMENTS

Nomenclature of the 12 Jupiterian years; —

Based on the star in which jupiter rises, 12 years have been named for every two stars starting from Krittika. The fifth, eleventh and the twelfth years are of three stars each. They are given below correlated with terrestrial events:

<i>Stars</i>	<i>Year name</i>	<i>Terrestrial events</i>
Krittika Rohini	Kārtik	People with vehicular and thermal jobs are afflicted; people tend to be war minded and sick prone; but red and yellow flowers flourish.
Mrigashira Āridra	Mārgashir	Shortage of rains and destruction of grains due to rodents, wild animals and birds; sickness to people.

Punarvasu Pushya	Poush	People will be happy but there will be inflation on food grains.
Āshlesha Makha	Māgh	People live happy, healthy and most religious; good rains and fair price of food grains.
Pubba Uttara Hasta	Phālgun	Crops will grow only at places and peace of people will be disturbed.
Chitta Swati	Chaitra	Little rains, crops poor, short of food grains are said but increase of grains in grannery and affliction to handsome people.
Vishākha Anurādhā	Vaishākh	Increase in food grains and peaceful earth.
Jyeshtha Moola	Jyeshtha	Affliction to respectable, rich and important people and to most crops.
Purvāshādha Uttarāshādha	Āshadha	Shortage of rains at places and growth of crops at different places, people will be just satisfied.
Shravana Dhanishta Shatabhisha	Shrāvan	Increased crops and affliction to people of irreligious temperament. The crops of seeds sown prior to
Purvābhādra Uttarābhādra	Bhādrapad	the commencement of the year grow well but those sown during this year fail.
Revati Ashwini Bharani	Āshwayuj	Excessive rains, increased crops and happy people.

If jupiter transits a star on its north side then there will be peace and plenty on the earth; if on the south side then there will be shortage of food and people will be less happy; and moving in the middle of the star jupiter is correlated with just satisfactory nature of things.

If jupiter transits the distance of or arcs of two stars during a year, peace and plenty are correlated; transiting the arc of two and a half stars just satisfactory nature of things are correlated; and transiting more than the arcs of two and a half stars jupiter's movement is correlated with destruction of crops.

If jupiter resembles the colour of fire, fire accidents are noted; of yellowish white, sickness; of cloudy colour, war; of greenish colour, losses; of red colour, fear and of smoky colour, rainlessness. If jupiter is seen in day time, then political changes are noted.

Varāhamihira then describes the 60 year cycle of jupiter. This is followed even to this day. The Yuga concept of Lagadha, appears to have continued after careful improvement. In all 12 yugas, each of 5 years have been considered and the names of the 5 years appear to owe their origin to Lagadha's Vedanga Jyotisha. The names of the Yugas are given below:

Names of the Yugas:

Vishnu	Pita
Brihaspati	Vishwedeva
Indra	Soma
Agni	Indrāgni
Prajāpati	Ashwinikumar
Ahīrbudhnyā	Sūrya

and it is said that the first of the 60 years cycle called « Prabhava » commences when jupiter rises in the 1° of Dhanishta star during Māgha lunar month. Out of the above 12 yugas, the first four yugas are said to be good periods; the middle four yugas satisfactory and the last four bad periods.

The year Prabhava is noted to coincide with great happiness of the biological world. But, there will be shortage of rains at places and excess of rains at other places, there will be fire accidents at places and storms in certain other places, and there will be epidemics at places and sickness due to cold at other places. However, it is generally observed that during Prabhava year, life will not feel the disturbances much. The following Vibbhava, Shukla, Pramodūta and Prajotapatti years of the first yuga are witnessed with gradual improvement in the living conditions.

In the second juga, the first three years called Āngira, Srimukha and Bhāva are said to be good periods while Yuva and Dhātu years are noted to be of medium type. In the first three years good rains have been recorded while in the later two shortage of rains.

In the third yuga, the years Īshwar and Bahudhānya are given to get good rains; the next year called Pramāthi is said to give bad results; and the last two years Vishu and Vikrama though witness peace and plenty, suffer from epidemics.

The fourth yuga, results are given below:

Chitrabhānu	Good rains, peace and plenty.
Subhānu	Just sufficient rains, of epidemics and death.
Tārana	Excessive rains.
Pārthiva	Crops increase.
Vyaya	A period of pomp and festive.

Similarly in the fifth yuga:

Sarvajit	
Sarvadhāri	Excepting this year i.e.
Virodhi	Sarvadhāri, others witness,
Vikrit	unhealthy climate.
Khara	

In the sixth yuga:

Nandana	The first three are favourable years.
Vijaya	
Jaya	
Manmatha	A satisfactory year.
Durmukhi	A bad period for rains and crops.

In the seventh yuga:

Hevilambi	Excessive rains and drought and rains charged with winds.
Vilambi	Excessive rains but little grains.
Vikāri	Excessive rains and drought.
Shārvari	Famine.
Plava	Good rains and good crops.

In the eighth yuga:

Shubhakrit	
Shobhakrit	First two years witness peace and plenty.
Krodhi	A bad year.
Vishwāvasu	The last two of medium yield.
Parābhava	

In the ninth yuga:

Plavanga	A difficult year.
Kilaka	The second two years good period.
Soumya	
Sadhārana	Short of rains and rage of epidemics.
Virodhakrit	At places rains and at some places crops.

In the tenth yuga:

Paridhāvi	Little rains, destruction of Madhya desh and fear of fire.
Pramādhī	Destruction of red seeded vegetation.
Ānanda	Peace and plenty.
Rākshasa	Increase in wheat and red gram etc.
Nala	Fire accident etc.

In the eleventh yuga:

Pingala	Excessive rains and epidemic cough.
Kālāyukti	Plenty of fruits.
Siddhārti	Plenty and prosperity.
Roudri	Destruction of crops and people.
Durmati	Even rains.

In the twelfth yuga:

Dundubhi	Increased crops.
Rudhirodgāri	Terrific rains.
Raktākshi	Epidemics.
Krodhana	Unpleasantness in public.
Akshya	Much destruction.

CORRELATION OF THE MOVEMENTS OF VENUS WITH TERRESTRIAL EVENTS

Based on rising or setting of venus in various starry arcs, the changes in biological and climatological fields have been noted. They are given below:

Rising or setting of Venus in the arcs of Biological and Climatological changes correlated with

I Mandala:

Bharani	Peace on the earth excepting Anga, Vanga, Kalinga and Mahisha regions; Political changes if there be association of any other planet with the rise of venus in Bhadrashwa, Shurasena, Youdheyika and Kotivarsh regions.
Krittika	
Rohini	
Mrigashira	

II Mandala:

Āridra	Production of excessive crops; association of other planets with the rising venus is denoted to correlate with degeneration of the people of Mithila, forest dwellers and people with jobs of thermal nature.
Punarvasu	
Pushya	
Āshlesha	

III Mandala:

Makha	Famine is noted; if venus is with other planets when rising, then destruction of people of Poundr, Aparānt, Shoolik, Drāvid and Maritime areas.
Pubba	
Uttara	
Hasta	
Chitta	

IV Mandala:

Swāti
Vishakha
Anurādhā

With other planets venus rising indicates affliction to people of Kirāta, Pratyanta, Avanti, Pulinda, Tengana and Shoorasena regions.

V Mandala:

Jyeshtha
Moola
Purvāshādha
Uttarāshādha
Sraavana

Famine and epidemics are noted; and indicates affliction to peoples of Kāshmir, Ashmaka, Matsya; if rising venus is with other planets then affliction to peoples of Drāvid, Ābhir, Ambasht, Trigart, Sourashtra, Sindhu, Souvir and Benaras regions.

VI Mandala:

Dhanishta
Shatabhisha
Purvābhādra
Uttarābhādra
Revati
Ashwini

Peace and plenty rule the earth; if venus rises with other planets then, affliction to people of Gandhāra, Avanti and Shoolik regions and destruction to people of Videha.

If venus is seen during sun set, some kind of fear is portended; if during the day, then, famine and epidemics is denoted; if seen in mid day with moon, then some kind of political disturbance is said.

Venusian movement dissecting Krittika star is noted to coincide with excessive floods. Dissecting the star Rohini, venus indicates excessive deaths. In Mrigashira venus is correlated with destruction of crops; in Āridra excessive rains and destruction of people of Kaling and Koshala regions. Epidemics rage Ashmak and Vidarbha regions when venus moves through Punarvasu star; in Pushya, venus indicates excessive rains; moving in Āshlesha venus is indicated to afflict people and serpents and in Makha, excess rains; similarly the results of venusian movement in other stars is given in the table:

*Movement of venus
in stars*

Results correlated

Pubba	Excess rains and destruction of people of Pulinda and Shabra regions.
Uttara	Affliction to people of Kuru, Panjab, and Jāngala regions.
Hasta	Little rains and affliction to artists and people of Kuru desh.
Chitta	Considerable rains.
Swāti	Excess rains and epidemics to naval, business and ambassadorial people.

Vishākha	Good rains but difficulties to business community.
Anūradha	Differences amongst administrators.
Jyeshtha	Death of chief administrator and no rains.
Moola	Death to chief surgeons.
Purvāshādha	Life in water in danger.
Uttarāshādha	Spread of epidemics.
Sravna	Ear diseases.
Dhanishta	Affliction to people who disbelieve the Vedas. Affliction to people of bar-shops.
Shatabhisha	Considerable rains and affliction to gamblers,
Purvābhādra	people of Panjab and Kuru.
Uttarābhādra	Affliction to fruit plants.
Revati	Affliction to travellers.
Ashwini	Affliction to stables lords.
Bharani	Affliction to Kirāt and Yavan people.

If venus rises or sets in the 8th, 14th or new moon day of dark half, then there will be plenty of rains. If jupiter and venus are disposed opposite to each other, then people will be afflicted of many diseases, and no rains will occur.

If jupiter, mars, mercury or saturn are set in front of venus then there will be destruction of vegetation, no rains and breaking of mountains by thunder bolt.

If the colour of venus resembles that of fire, then fear of fire is noted; of red, then danger from weapons; of golden streak, then diseases; of parrot green colour, then heartrending cough and of ash colour, no rains.

CORRELATION OF THE MOVEMENT OF SATURN WITH TERRESTRIAL EVENTS

At the outset, Varāhamihira observes that when saturn transits Sravana, Swāti, Hasta, Āirdra, Bharani or Pubba stars and is with shining rays, then the earth will be drenched with rain water; transiting the arc of Āshlesha, Shatabhisha and Jyesta, though the earth will receive little rains, will be clad with green coat of luxurient vegetation and transiting the arc of Moola star, famine, shortage of rains and war tendencies will grip the earth.

Saturn's movement in individual stars is correlated with the events mentioned as below:

<i>Star Arc</i>	<i>Events</i>
Ashwini	Affliction to horses, horse men, posts, medicos and ministers.
Bharani	Affliction to musicians, dancers, people of orchestra and hunters.
Krittika	Affliction to people of thermal based jobs; destruction of army commanders.
Rohini	Affliction to people of Koshal, Madra, Kāshi, Panchal desh and those who earn livelihood on vehicles.
Mrigashira	Affliction to people of Vatsa desha, priests who conduct sacrifices, and people of Madhya desh.
Āridra	Affliction to people of Parāt and Madra desh, washermen, thieves.
Punarvasu	Affliction to people of Punjab, Pratyanta, Sourashtra, Sindh, Souvir.
Pushya	Affliction to people of Yavan, Kirāt, business community and rogues.
Āshlesha	Affliction to oceanic produces.
Makha	Affliction to people of Bāhlika, China, Gāndhāra, Shoolik and Parāt desh as also business people, bankers, and Kirāts.
Pubba	Affliction to people of Maharashtra and those dealing with chemical and six rasas.
Uttara	Affliction to people of Taxila, beggers and joggary, salt etc.
Hasta	Affliction to people of Koshal desh, gardners, elephant capturers, body sellers hair dressors, potters, medicos and architects.
Chitta	Affliction to womenfolk, artists, writers, and trasurers etc.
Swāti	Affliction to people of Magadh, naval people, ambassadors, drivers, dancers.
Vishākha	Affliction to people of Trigart, China & Kulūt destruction of lac, haldi, kusumbh vegetation.
Anurādha	Affliction to people of Kulūt, Tengan, Napāl, Kāshmir; architects and potters.

Jyeshtha	Affliction to kings, priests, those respected by kings, strong and groups.
Moola	Affliction to people of Kāshi, Koshal and Panjab; also fruits, medicines and fighters.
Purvāshādhā	Affliction to people of Anga, Vanga, Koshal, Girivraj, Magadh, Poundr, Mithila and Tamrlipti regions.
Uttarāshādhā	Affliction to people of Dashārn, Yavan, Ujjain, Shabar, Pāriyātr and Kuntibhoj.
Shravana	Affliction to government servants, medicos and priests.
Dhanishta	Victory to the Magadh king and bankers.
Shatabhisha and Purvābhādra	Affliction to medicos, poets, barmasters, dalals.
Uttarābhādra	Destruction of many vehicle owners, those living on river banks, architects, womenfolk, and gold.
Revati	Affliction to peoples of Krounch Isls, shabaras. Yavanas and people in the service of kings as also crops of Shardrt.

When Jupiter is disposed in Vishākha star and saturn in Ashwini star, then there will be moral degeneration of people. Also, great fear and enmity in citizens is portended when both jupiter and saturn are disposed in the arc of one star.

Saturn if appears of variagated colour then, there will be destruction of birds; yellowish, then famine, red colour, war; ash colour, enmity amongst citizens.

Thus it can be seen the general observations on the biological, climatological, meteorological, sociological and environmental changes noted by various authorities earlier to Varāhamihira have been presented by him in a manner which is befitting to a student of the earth who is concerned with all aspects of life, and who sees the earth in the context of the universe. However, these observations may not include all those jobs found at the present juncture of human civilisation, for example pilots, mechanists, drillers, etc., etc. Strictly speaking, the present compartmentalisation of scientific disciplines may not include these studies under the earth science, but any study which has no relevance to human improvement is of little use. The situation is being improved by introducing interdisciplinary subjects and studies of environmental science subjects would certainly involve these and many other observations so necessary to the modern civilisation. A broad based « Earth and Planetary » science division need include these studies in the modern context and these and more observations should have a sound base of the Theory of Earth.

ADDITIONAL OBSERVATIONS BY VARĀHAMIHIRA

Varāhamihira has compiled many more observations on the correlation of terrestrial events with the lunar combination of other planets in various sectors of the ecliptic. He has observed that planets in group and in combustion indicate great famine, epidemic etc., in those areas on the earth indicated by the specific sector of the ecliptic. A correlation of starry heavens with specific areas on the earth has been presented but how far it is correct is to be examined by long standing observations. He has considered the Indian continent as the shell surface of a tortoise and each starry arc has been noted to govern certain areas within the continent. The given list in the Brihatsamhitā, although might have been prepared after very long observation, the names cannot easily be correlated with the modern nomenclature of those areas and the scientific basis of such a correlation is debatable. But, Varahamihira gives prime importance, as it should be, to the aspect of formation of rainy clouds, the nature of rains, the climatic and food influence of rains etc. He observes that the foundation of life is food and the growth of food is controlled by rainy season i.e. Varsrt which includes the lunar months Shrāvan and Bhādrapad, hence, this period should be examined in greater detail to know more about the annual rainfall and related aspects.

Accordingly, some early observation is that the rain-clouds form after Kārtik shukla poornima i.e. the full moon day of lunar Kartika month. However, Garga has observed that the nature of rain-giving clouds should be judged from the disposition of moon in Purvāshādhā star after the new moon day of lunar Mārgashir month. Further, it is observed, that the star in which moon is situated and rainy clouds form, 195 days from that day rain will fall. It is also observed that exactly on the 195th day after the formation of rainy clouds in the star in which moon is situated, the same star will rule by Sāvanamāna and not by Chāndramāna.

If the rainy clouds have formed in day time, then rain will occur in the night; if in bright half, rain in dark half; if in morning, rain in evening; also in the reverse order. Similarly, the direction of formation and precipitation of clouds and rain are said to be in opposition relationship.

Fall of meteorites and meteores, burning in the sky, earthquake, perturbation of planets. thunderbolt, eclipse etc., at the time of formations of rainy-clouds will destroy those clouds and disturb the rains and cause food imbalance. Clouds formed in Uttarābhādra, Uttarāshādhā, Purvāshādhā, Rohini and Purvābhādra in any season are stated to give plenty of rains. The clouds formed in Shatabhisha, Āshlesha, Āridra, Swāti or Magha stars remain full for long time. There will, however, be no rains so long they are disturbed by natural calamities. If rainy clouds are formed in any of the above five stars during Mārgashira

month, then it will cause full 8 days rain, 6 days rain in Pushya month, 16 days rain in Māgha month, 20 days rain in Phalguna month, 20 days rain in Chaitra month and 3 days rain in Vaishakha month.

A rainy cloud developed with all favourable aspects is said to rain over a hundred yojana area (one Yojana is about 4.9×4.9 miles) and the least rainy clouds may rain in area less than five yojanas. The measurement of rain water by «Drona» and «Ādhaka» system has been presented.

If the star in which rain clouds are formed is associated with planets like sun, mars and saturn, then rains with fishes, thunder and lightening will take place. If the sun or moon situated in the star of rainy cloud is aspected by mercury, venus or jupiter, then clouds form which give excessive rains. If the clouds are held for long time, then the rain will be of hailstones; and at the formation of rainy clouds if there be rains, thunderbolt. lightening etc., then there will be poor rains, the clouds having been destroyed.

The clouds are formed during the four days after Jyeshtha Shukla Ashtami (the 8th day of the bright half of lunar month of Jyeshtha). Pleasant wind coming from north, north-east or east and pleasant sky portend favourable cloud formation. In the bright half of lunar month Jyeshtha, if there be rains when the moon is transiting the arc of Swati, Vishākha, Anurādhā, and Jyeshtha stars, then there will be no rains during Shrāvana, Bhādrapad, Āshwayuja and Kārtika lunar months respectively.

Then Varāhamihira described in detail the various methods like the «Rohiniyoga» and «Swātiyoga» employed for ascertaining the nature of annual rainfall. Based on the nature and extent of the disc, hue, movement and other aspects of the moon transiting Rohini during drak half of Āshadha month, Swāthi during the bright of the same month and Āshadha during the full moon of the same month, many observations have been made which help ascertain the nature of rains.

Many observations have also been made based on the nature of winds. Certain indications when immediate rains fall are also presented.

Although these observations are specially within the purview of modern meteorology, the subject in very much to do with earth science in larger context. However, the depth of the theory can be examined when Varahamihira presents his observations on one of the most fascinating and at the same time stumbling branches of modern geology and geophysics, the problem of earthquakes. Also his treatment of groundwater inventory and civil engineering and architectural aspects of the earth and earthy materials are no less modern. The present writer has given the details of these topics elsewhere.

Of course Varāhamihira's contribution, if any, on the subjects of mining and metallurgy are not known. He also does not include anything about alchemy or related subjects in the text. It can be appreciated

that in those ancient times, though Kautilya's Arthashastra includes chapters on mining and metallurgy, there appears to have been no attempt to preserve the ores and mineral samples on the lines of a modern Museum. Both the authors of Brihatsamhitā and Arthashastra are good gemmologists. The absence of systematic study of all the materials of the earth, appears to indicate that only selective appreciation of earth materials were prevalent during those times.

VARĀHAMIHIRA'S CONTRIBUTION TO THE VEDIC THEORY OF THE EARTH - AN APPRECIATION

A brief out line of Varāhamihira's contributions to the Vedic theory of the Earth presented in the foregoing can easily be said to be splendid and unique compilation of earlier observations with his critical remarks and original contributions. A most useful theory of this type, which has been held in high esteem even to this day by astronomers well versed in sanskrit language, is itself a testimony for the outstanding contribution made by Varahamihira, specially in the distant past and when the concepts of modern science of earth were non-existent. Although a theory of the earth of the type propounded by the early observers in India may be distinct from the modernity and only of utilitarian outlook, this theory can easily form as a « Working Hypothesis » for the modern students of the earth. While it may lack many of the aspects of modern geological subjects, yet it has the truth and elegance enveloped in poetic language.

While critics may observe that the concepts of the theory are mostly extra-terrestrial and there is little of geology in the modern sense, critics also should admit that there is not even a working hypothesis of similar utilitarian outlook in the modern concepts of geology, which was rather purely terrestrial and confines to the study of earth materials mostly. A theory which can help geological planning based on earlier observations of natural phenomena in various habitable regions of the earth is due. In this connection, the Theory of the earth in Sanskrit literature and the concepts of modern geology may be complementary to each other.

1. Brihatsamhitā of Varāhamihira, Chowkhamba Vidyabhavan series, Banaras, 1959.